

# THE MOSASAUR



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# **THE MOSASAUR**

## **The Journal of the Delaware Valley Paleontological Society**

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**COVER** — A reconstruction of the terrain at the Port Kennedy, Pennsylvania, sinkhole that preserved a Late Irvingtonian fauna and flora. (See the paper by Daeschler, Spamer, and Parris in this volume.) Rendered by Bruce Mohn, Copyright © Bruce Mohn.

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The Delaware Valley Paleontological Society thanks the Department of Malacology, Academy of Natural Sciences of Philadelphia, for the facilities to produce the camera-ready pages of this volume. Page composition by Earle Spamer.

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# Probable occurrence of the shark genus *Palaeocarcharodon* (Neoselachii: Cretoxyrhinidae) in the Paleocene of New Jersey

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**ABSTRACT**— The recent discovery of an incomplete tooth appearing to be an anterior tooth of the selachian genus *Palaeocarcharodon* in the Paleocene of New Jersey, brings to light another occurrence in North American of that generic type, previously only known from Africa and Russia.

## Introduction

CASE (1989) noted the first occurrence in North America of the selachian genus, *Palaeocarcharodon*. This paper is the second note of occurrence for *Palaeocarcharodon* on this continent. The first discovery was in the Lower Aquia Formation (Paleocene) of Maryland.

Ward and Wiest (1990) do not list *Palaeocarcharodon* as occurring in the Paspotansa Member of the Upper Aquia Formation. According to Gibson, et al (1991); the Paspotansa Member of the Upper Aquia Formation is considered to be Late Paleocene (Selandian) in age.

According to Arambourg (1952:120), Leriche discovered specimens of *Palaeocarcharodon* in the extreme base of the Eocene ("c'est-à-dire au Montien") in the cliffs at Landana in the western Congo of Africa. Leriche (1919) described these specimens as a new species, *landanensis*, not realizing that Sinzow (1899) had already given this selachian the specific name, *orientalis*, from specimens recovered from Yakaterinaburg (Sverdlovsk) in the Ural Mountains, Russia.

Most findings of *Palaeocarcharodon orientalis* (Sinzow), including its synonym, *P. landanensis*, have been recovered in the Thanetian Stage (Upper of Late Paleocene), and any attributed to either the Montian (Danian in America) or the Landanian to Ypresian, are questionable.

The present specimen was recovered at the Inversand marl pit, at Sewell, Mantua Township, Gloucester County, New Jersey. It was collected by Steven Kurth on November 23, 1991, during a Delaware Valley Paleontological Society field trip to the pit (personal communication, William B. Gallagher). The tooth, missing most of its root and lateral cusps, was recovered from a stream-bed in the southeast corner of the Inversand Pit. Its horizon within the Hornerstown Formation is uncertain, but it is probably Thanetian or Late Paleocene in age.

## Systematic Paleontology

Class Chondrichthyes  
Subclass Elasmobranchii  
Cohort Euselachii  
Superorder Galeomorphii  
Order Lamniformes  
Family Cretoxyrhinidae  
Genus *Palaeocarcharodon* Casier, 1960

*Palaeocarcharodon orientalis* (Sinzow, 1899)  
(Fig. 1)

**MATERIAL**—One isolated anterior tooth, probably from the lower jaw, missing most of its root area, including any possible lateral cusps. Five other specimens attributed to *Palaeocarcharodon*, which

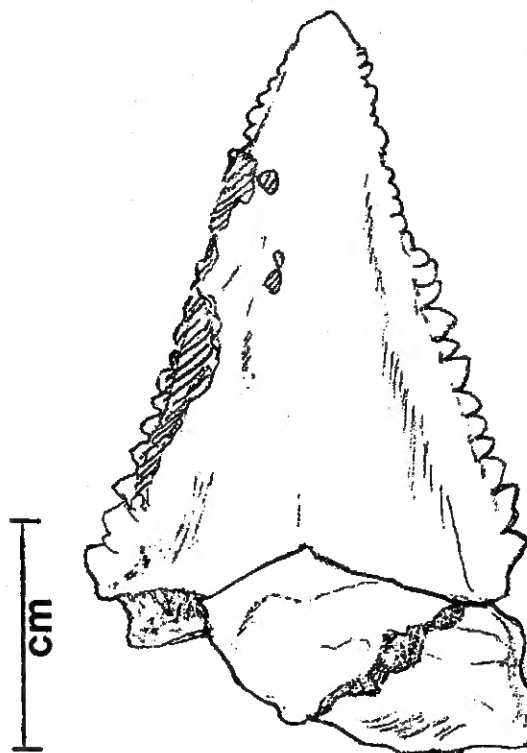


Figure 1. Anterior tooth, lower jaw, of *Palaeocarcharodon orientalis* from the Inversand marl pit, Sewell, New Jersey (NJSN 15466). The shaded area along left side of tooth indicates matrix adherence.

have been recovered at the Inversand marl pit by workmen and donated to the collections of the New Jersey State Museum at Trenton (NJSN 15465), are not being studied as part of this present paper due to their incompleteness (lacking roots, lateral cusps, etc.). The specimen described here is NJSN 15466.

**DESCRIPTION**—An incomplete anterior tooth provisionally assigned to the selachian genus *Palaeocarcharodon*, as *P. orientalis* (Sinzow). The tooth measures approximately 28 mm on its longest vertical angle, and lacks lateral (side) cusps and part of the root area.

**DISCUSSION**—The specimen from Sewell compares closely with specimens of *Palaeocarcharodon* (lacking root areas and lateral cusps) that were collected by the author in 1972 and 1976 in the Kingdom of Morocco, North Africa. Teeth of *Carcharocles* from the Eocene are also very similar with respect to the serrations along the edge of the tooth. In fact, the serrations of *Palaeocarcharodon* and *Carcharocles* are too similar to be used as criteria in separating the two genera—which, by the way, are placed in separate families by Cappetta (1987).

On first inspection, the six teeth recovered at the Inversand pit were assumed to be broken specimens of *Carcharocles*, a genus which makes its first appearance in the Ypresian (Early Eocene) as a direct descendant of *Otodus obliquus* Agassiz (= *Lamna obliqua* of authors), one that has developed serrations. The author has seen specimens of *Otodus obliquus* from the Middle Eocene greensands of New Jersey that have developed vestigial if not erupted serrations. Indeed, there is very little difference in general structure between teeth of *Otodus obliquus* and *Carcharocles*. The essential difference is that the latter has serrations while the former does not.

Cappetta (1987:101) states, in regard to *Palaeocarcharodon*, "This genus probably branched from the genus *Cretolamna*, but because of the strong labio-lingual compression of the teeth, no known species of *Cretolamna* can be singled out as a possible ancestor of *Palaeocarcharodon*." The present author believes that on the other hand, *Carcharocles* probably evolved from either *Plicatolamna* (*Cretodus*) or *Protolamna* by way of *Otodus obliquus* (*Lamna obliqua*).

The author wishes to reiterate that he feels that this specimen should be provisionally assigned to the genus *Palaeocarcharodon* due to its uncertain stratigraphic provenance.

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